



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------|-------------|-----------------------|---------------------|------------------|
| 10/516,583 | 03/24/2005 | Charles Eugene Stroud | 46872/308797 | 9939 |
| 44231 | 7590 | 12/06/2007 | EXAMINER | |
| KILPATRICK STOCKTON LLP - 46872 | | | | MOFFAT, JONATHAN |
| J. STEVEN GARDNER | | ART UNIT | | PAPER NUMBER |
| 1001 WEST FOURTH STREET | | 2863 | | |
| WINSTON-SALEM, NC 27101 | | MAIL DATE | | DELIVERY MODE |
| | | 12/06/2007 | | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/516,583 | STROUD ET AL. | |
| | Examiner | Art Unit | |
| | Jonathan Moffat | 2863 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 09 October 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-35 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,3-7,13,17,18,21,30 and 31 is/are rejected.
- 7) Claim(s) 2,8-12,14-16,19,20,22-29 and 32-35 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's response, made after final rejection, on 10/9/2007 is accepted and appreciated by the examiner. As the examiner who previously reviewed this application is now no longer with the office, this application has been transferred to the present examiner. The present examiner agrees with applicant's assessment as to the validity of the rejection made under 35 USC 102(a) on 6/8/2007. Additionally the examiner feels that the applicant would benefit from further time to argue the rejections made on 11/29/2007 herein reapplied. Because of all these above considerations, this action is hereby made **non-final**.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1.

Claims 1, 3-7, 13, 17, 21, 30-31 rejected under 35 U.S.C. 102(e) as being anticipated by Abramovici (US pat 6874108).

With respect to claim 1 Abramovici discloses applying a test pattern approximately simultaneously to a first path under test in the field-programmable gate array and a second path under test in the field-programmable gate array, wherein the first path under test and the second path under test have substantially the same propagation delays in a fault free circuit; Note

column 2, lines 36-44 and Figure 4. Abramovici et al. teach receiving a first output signal indicating that the test pattern has propagated through at least one of the first path under test and the second path under test; Note column 2, lines 36-44 and Figure 4 and column 5, lines 23-31. Abramovici et al. teach receiving a second output signal that indicates the test pattern has propagated through each of the first path under test and the second path under test; Note column 2, lines 36-44 and Figure 4 and column 5, lines 23-31. Abramovici et al. teach determining the interval between receiving the first output signal and the second output signal; Note column 5, lines 31-36. Abramovici et al. teach identifying a fault in at least one of the first path under test and the second path under test when the interval exceeds a threshold (matching). Note column 5, lines 34-37. Abramovici et al. teach causing an indication of the fault to be output. Note column 5, lines 37-38.

With respect to claim 3, Abramovici does not explicitly disclose wherein the test pattern comprises contain a high to low transition however this would be inherent to the test pattern of Abramovici et al. Note column 5, lines 25-27.

With respect to claim 4, Abramovici does not explicitly disclose wherein the test pattern comprises contain a low to high transition however this would be inherent to the test pattern of Abramovici et al. Note column 5, lines 25-27.

With respect to claim 5, Abramovici discloses generating the test pattern. Note column 5, line 18 and 19.

With respect to claim 6, Abramovici discloses configuring the first path under test and the second path under test. Note column 3, lines 50-53.

With respect to claim 7, Abramovici discloses developing a configuration for the first path under test and the second path under test. Note column 3, lines 50-53.

With respect to claim 13, Abramovici discloses an input. Note column 5, lines 24-25. Abramovici discloses a first path under test in the field-programmable gate array, the first path under test in communication with the input; Note Fig. 4. Abramovici discloses a second path under test in the field-programmable gate array, the second path in communication with the input, wherein the second path has an expected propagation delay substantially the same as the first path under test; Note Fig. 4 and column 5, lines 31-32. Abramovici discloses an output response analyzer in communication with the first path and the second path and operable to determine an interval between the time a data signal propagates through the first path under test and the second path under test. Note column 5, lines 31-37.

With respect to claim 17, Abramovici discloses wherein the programmable logic blocks in the first path under test and the second path under test comprise identity functions. Note Abramovici column 6, lines 59-64.

With respect to claim 21, Abramovici discloses neither of the first path under test and the second path under test comprises a flip flop. Note Figure 4.

With respect to claim 30, Abramovici discloses that the paths under test, the test pattern generator, and the output response analyzer are all contained in the same vertical self-testing area (V- STAR). Note column 2, lines 23-24.

With respect to claim 31, Abramovici discloses that the paths under test, the test pattern generator, and the output response analyzer are all contained in the same horizontal self-testing area (H- STAR). Note column 2, lines 23-24.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 18 is rejected under 35 U.S.C. 103(a) as being obvious over Abramovici in view of Stroud (US 6003150).

Abramovici fails to disclose that each of the first path under test and the second path under test comprises at least one lookup table (LUT) and where each LUT is configured to produce a transition when the input of the LUT changes to a specified target address.

Stroud teaches that each of the first path under test and the second path under test comprises at least one lookup table (LUT) and where each LUT is configured to produce a transition when the input of the LUT changes to a specified target address. Note column 5, lines 51-58.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Abramovici to include the testing of look-up

tables as taught by Stroud. One of ordinary skill in the art would understand that the response time of a LUT can be a critical factor in system performance. Delays in retrieval of data from this and similar storage mechanisms could indicate a number of types of failures of interest including, as stated in column 7 lines 52-53, "undetectable faults".

Response to Arguments

Applicant's arguments filed 3/29/2007 concerning the above rejection have been fully considered but they are not persuasive.

The present examiner maintains that the rejection of these claims as anticipated by Abramovici remains valid. The applicant argues that Abramovici fails to disclose determining a fault or error based upon a threshold crossing in a difference between two delay values (signal indicating one has propagated and a signal indicating that both have propagated).

The examiner respectfully disagrees with this statement. As in the above cited portions, Abramovici discloses a comparison between two results (Figure 4 summarizes this process). As is indicated in column 2 lines 57-67, the values may be delay or propagation values. The difference in time between the arrival of one signal and another (one PLB branch and another of figure 4) would indicate a failure and meets the language of the claims. The inclusion in such language of a "threshold" does not alter this. One could make the argument that any deviation in propagation times is a failure. This would effectively be a comparison to a threshold of 0s. However, one of ordinary skill in the art would assume that a system such as that of Abramovici would have some built-in tolerance for comparison. Tolerances are often used to eliminate false-positives and to account for noise or other variations. These tolerances comprise thresholds.

Conclusion

Claims 2, 8-12, 14-16, 19-20, 22-29 and 32-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for potential allowability of these claims has been laid out in the previous office actions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Moffat whose telephone number is (571) 272-2255. The examiner can normally be reached on Mon-Fri, from 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12/4/07
JM *Jon*


John Barlow
Supervisory Patent Examiner
Technology Center 2800